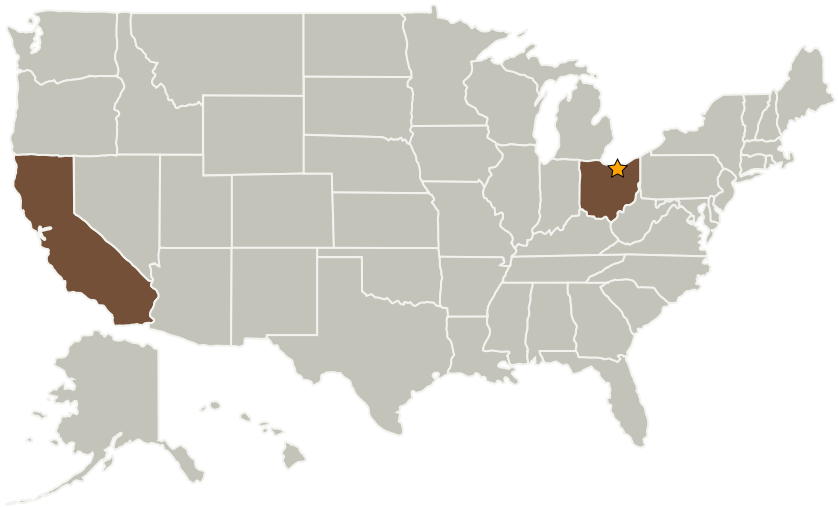
Affordable High Performance Electromagnetically Clean Solar Arrays, Phase I

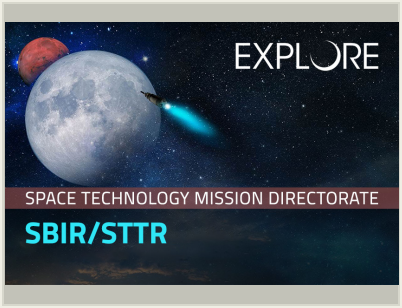
Completed Technology Project (2006 - 2006)

Project Introduction

We propose an Electromagnetically Clean Solar Array (ECSA) with enhanced performance, in Watts/kg and Watts/m2, using flight proven, high efficiency solar cells. For electrostatic cleanliness, our innovation is to use large flat sheets of specially processed environmentally durable, ITO-coated DC93-500 transparent silicone material to replace the multitude of coverglasses and grounding components on a solar panel. For magnetic environments, we propose the use of a Kapton layer with a printed wiring pattern that mirrors the solar cell string to cancel magnetic moments. This metallized Kapton layer would replace the bare Kapton normally used as the solar panel substrate insulating front surface. A key innovation is to reduce the cost of solar panels by adapting the transparent shielding layer and the printed circuit layer with features to assemble solar cells into completely connected and wired panels using lamination. Features built into the layers position the Cell-Interconnect (CI) assemblies, solder pre-forms and wiring connections, allowing a one step process for "glassing," stringing, laydown and wiring. This eliminates the most costly labor and schedule intensive elements of conventional solar panel assembly. This research directly addresses the topic needs of providing electrostatic and magnetic cleanliness and affordability for flight proven solar panel technology.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Vanguard Space Technologies, Inc	Supporting Organization	Industry	San Diego, California

Primary U.S. Work Locations	
California	Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.1 Power Generation and Energy Conversion
    - TX03.1.1 Photovoltaic